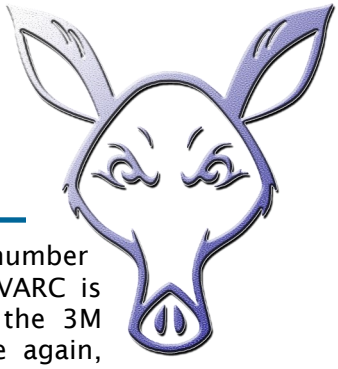
Issue 55
April 2024

Utah Valley Amateur Radio Club

The UVARC Shack

A K7UVA winter



Another successful Winter Field Day. Based on the number of contacts and the points calculated by N3FJP, UVARC is projected to be the 2024 WFD winner again for the 3M (three-transmitter mobile) club category. And once again, Chad Bowcut KD7BKO came to our rescue and linked up all our laptops. Huge thanks to Michele Costello KI7HBP for organizing us, and to Lawrence Muir KJ7GRG, Joe Costello WH6QV, and Carl Pockrus WE7OMG for towing their RVs to the site for us to use. Most of all, thanks to you for coming to help, set up, operate, and eat our pizza!

In this issue of the *UVARC Shack*

Club meetings feature a lesson about SWR, plus how to prevent government overreach.

My Shack spotlights a duo, KJ7UVZ and KG7RJ. *Amateurs in Action* in the New Hampshire woods. *Brass Tacks* on test instrumentation.

Dear Annette on why renew your ARRL membership, and talking with an unlicensed operator. *Hot Tips* about collecting dust. *DIY* for a 9:1 unun. *The Amateur in You* on call sign rules and a two-minute warning. *Living in the Past* features a famous antenna.

Please send your ideas to ***uvarcshack@gmail.com***

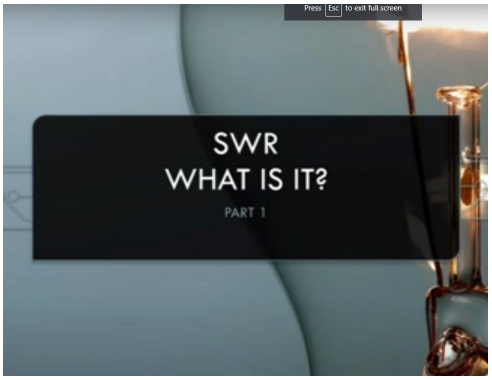
Inside this issue

Other points of interest

Club meetings

Recap

February 2024 club meeting – SWR Mysteries, Part 1



Shawn Hatfield KJ7SNE gave us an elementary look at SWR down on our level, and why we're interested in its effects. He even threw in some attention-grabbing humor to hold our interest, although his terrific teaching style made that unnecessary. He'll continue with Part 2 of the SWR story in a later club meeting. You can see a recording of the meeting on this link, thanks to Trevor Holyoak AG7GX.

March 2024 club meeting – Preventing Government Overreach

Jeri Brummett WJ3RI, ARRL Assistant Section Manager, gave a very informative and engaging presentation on how to prevent government overreach. She mentioned tips on how to stay in touch with government rulemaking by monitoring the political bands, and then advocate for the hobby. She suggested developing relationships with the city government, your HOA, and other parts of your community. Many new hams recently joined the club, which likely contributed to the attendance. The meeting video can be found here.

By the way, many of our past meetings are recorded and posted on the club YouTube channel.

My Shack

Highlighting the shack (ham equipment and room) of a member, to give others an idea of the possibilities that might work for them

Jessica Johnson, KJ7UVZ
Ryan Johnson, KG7RJ

Jess KJ7UVZ and Ryan KG7RJ Johnson's interest in amateur radio started in a side-by-side ride with a group including Larry Gray KJ7SNG. *He showed us these Baofeng radios that were so much better than your typical FRS walkie-talkie.* Ryan did some research and found out how to get a license, studied and got his Technician license. Jess thought it was ridiculous that she would need a license to talk on what appeared to be a fancy walkie-talkie and teased Ryan a lot.

After talking to Ryan about the test, and an insane competitiveness on Jess's part, and a promise to buy Jess her own radio when she passed, Jess studied and took both her Technician and General on the same day and passed; the General, just to one-up Ryan. Now that she had the capability to get on HF, and a fascination with being able to talk to people around the world, Gary Beach KG7FXG, sold them his Icom IC-718 and Sam Howlett KI7RFM, gave us his no-longer-used Hustler 5-BTV HF antenna. Not liking restrictions or having to be careful about where she was talking, Jess studied to become an Extra. Now that we had this toy, and not wanting to be upstaged by his wife any more, Ryan studied for his General and they passed those tests at the same time. After passing, Ryan took his Extra, having only minimally studied, just to keep Jess humble, and passed the same day.

Along with the HF rig, they have a sweet Pockrus J-pole in the attic, a Retevis RT3S DMR, and Jess rides with her TYT TH-9800 in her Suburban. And of course some Baofeng UV-5Rs kicking around.

The hobby has kept Jess amazed at the ability to talk to others far away, and it has expanded Ryan's obsession with photons, and how they can be used to see, cook food, and communicate, among other things, by just frequency changes.

We've enjoyed the friendships we've made through the club, and although we don't have as much time to dedicate to their new hobby because they're in the thick of raising six kids, we enjoy having a hobby that we can learn and do together. Two of their children have shown interest in the radio and their then twelve-year-old Zachary studied and passed his Technician license and became KK7KPG.

My Shack
continued

We have enjoyed getting involved in radio and community events. We've helped with the Days of '47 Parade twice, America's Freedom Festival, and also the fireworks at Oremfest.

Jess and Ryan is UVARC's sweetheart couple, and they've helped out tremendously at Field Day. They put on a wonderful presentation in our June 2023 club meeting, explaining and then actually demonstrating how to work Field Day, including the logging, using Curtis MacPherson N1JDI as their contact.

Many will remember the husband / wife team teaching us about Field Day, June 2023

– 73, Ryan and Jess

Amateurs in Action

Recounts of ham radio operators who have used their effort and skills to help others in a time of need

Lost in the woods

Bill Barber NE1B

It was a terrific Sunday for a short hike on 11 December 2022. Ed Lawson K1VP set out with his dog Molly on Leavitt Road, near Belmont, New Hampshire, for what would normally have been an easy and uneventful stroll. He had his smartphone, a handheld DMR ham radio, and plenty of daylight, but left his daypack home, since for him this was just a short walk.

Feeling energetic, Ed decided to depart from his intended trail to take a side path, which would require a little bushwhacking to meet up with a distant snowmobile trail. What he didn't know was that the area he was cutting through had recently been logged, and so did not appear the same as what he remembered. Soon, Ed realized he and Molly were lost. He pulled out his phone to alert his wife, only to find its battery was drained.

He turned to his remaining communication device, the DMR ham radio, and called through a recently installed DMR repeater on nearby Gunstock Mountain for somebody to contact his wife. Right away, Bill Barber NE1B answered Ed's call, and got hold of Ed's wife. Once Bill explained the situation, Ed's wife called 911, and the search was on. Bill soon looped in Rick Zach K1RJZ, who was much more familiar with hiking trails in the area.

Rick Zach K1RJZ

Local police and fire units were called in to assist with the search, and they positioned vehicles at likely locations based on information provided by Rick, who relayed information between Ed and the rescue team. The search team sounded sirens at intervals, in hopes Ed could hear them, but Rick repeatedly told them that Ed could not hear them, which at least told them *where Ed was not*.

Chuck Cunningham K1MIZ

After a while, Chuck Cunningham K1MIZ, who was monitoring the search, noticed that Ed had accidentally changed channels. Once Bill and Rick regained communication with Ed, thanks to Chuck, Ed was able to maintain contact until he saw some distant lights, and hiked out to Federal Street, where he found the searchers and notified them. The search was over, and Ed was finally reunited with his wife.

Among other lessons learned, Ed said, *No matter how short you think a hike is going to be, you should take your daypack*. He also mentioned that a flashlight would be a good thing to pack.

You can read more about Ed's adventure on the *Laconia Daily Sun* and on ARRL.

New Hams and Upgrades

New hams

K9BDT = Austen McCleary
KK7QVK = James Flake
KK7QVO = Cole Jensen
KK7OXG = Eric Marsing
KK7QXJ = Wade Massey
KK7QXT = Wyatt Bake
AI7WD = Orion Bateman
KK7RBD = Seth Burch
KK7RCS = Misty Mathews
KK7RGJ = Woodson Parker
KK7RGS = Phillip Taylor
KK7RGT = Tony Gonzalez
KK7RIK = Daryl Yardley
KK7RIL = John Carmen
KK7RIM = Francoise Hughes
KK7RJM = Bryant Smith
KK7RJZ = Eliason Smith
KK7RKA = Michael Smith
KK7RKB = Tirzah Smith
KK7RKC = Sergio Martinez
KK7RKM = Mark Radandt
KK7RLA = Jonathan Diel
KK7RLZ = Darrell Jakins
KK7RMF = Daniel Nielson
KK7RNX = Trevor Wiseman
KK7ROH = Hunter Page
KK7RPH = Steven English
KK7RPR = Shawn Scott
KK7RRH = Darrell Cook
KK7RRI = Mark Crosby
KK7RRJ = Charles Davis
KK7RRK = Blaine Forbush
KK7RRM = Seth Warr
KK7RRP = Blaine Cook
KK7RRQ = Tyler Moses
KK7RRR = Grayson Schmalz
KK7RRS = Brendon Moser
KK7RRU = Hal Shearer
KK7RRV = Lila Shearer
KK7RRW = Wade Shearer
KK7RRX = Max Shearer
KK7RSY = Cayden Jorgensen
KK7RSZ = Timothy Lockwood
KK7RTA = Jesse Brazell
KK7RTB = Cody Brazell
KK7RTL = Mike Lierman
KK7RTY = Chase Jessop
KK7RUI = Sean Fletcher
KK7RUJ = Jessy Barney
KK7RXQ = Andrew Mulkern
KK7RZT = Caleb Bateman
KK7RZU = James Beard
KK7SBT = Dallin Bateman
KK7SBM = Thomas Talbot

Upgraded hams

N9MSM = Jason Nielsen (Extra)
KE7FGR = Lawrence Rees (Extra)
KF7KBQ = David Porter (Extra)
KK7LBK = Henry Wright (General)
KK7POD = Cameron Porcaro (General)

Congratulations to all these diligent folks! We look forward to hearing you on the radio soon.

Events

Upcoming happenings

Summer Field Day

As is our tradition, UVARC will be participating in Field Day at noon on Saturday June 22 through noon Sunday June 23. Our location this year will be at the same place as last year, up Trout Creek, about a quarter of a mile north off Highway 40, at an open location. Our Field Day Potluck will be that Saturday afternoon the 22nd, and a sign-up sheet will be posted.

We'll be asking for help from generous club members, to provide two RVs, in which we can establish our stations, and nearby antennas. And of course, we'll need help taking it all down Sunday at noon too. We also need three volunteers with the ability to tow the communication trailer, the club trailer, and the port-a-potty trailer. More details as we get closer.

76ers Annual Barbecue

Lynn Hancock K7LSH and Carl Pockrus WE7OMG have once again secured the pavilion at Highland Glen Park for our annual barbecue, this year on Saturday June 1, from 10 am to 3 pm.

If all goes as planned, we'll have a fox hunt, an HF station set up for you to get on the air, and a door prize drawing. If you'd like to contribute toward the food or door prizes, please get hold of Carl or Jeremy Giovannoni K7TEH. The address is 4800 Knight Ave, Highland.

Ham Radio Fair

Our annual Ham Radio Fair, will be held 6:00 pm on Thursday 18 July, in the large pavilion at Pheasant Brook Park, 400 N 800 W in Lindon. Families, friends, friends of your family, are welcome to check out the stuff, the stations, and the fun of amateur radio.

See how others set up an actual VHF or portable HF station, go-kit, and their antennas. See how to set up a solar solution, a digital station, how to program an HT, and what the possibilities are. And we'd love to have you volunteer your own setup or expertise!

76ers Annual Ice Cream Social

It's time once again for the 76ers Annual Ice Cream Social, at Leatherby's in Orem, 304 E University Parkway. Bring your family on Saturday September 7 at 1:00 pm, and join us for lunch and treats. They have burgers, fries, and deli sandwiches, as well as world-class shakes.

UVARC Swap Meet

Heads up! The Utah Valley Swap Meet this year will be 9:00 am Saturday September 21, at the Spanish Fork North Park Pavilion, 1185 N 400 E. One of our few fund-raisers, entrance is$5 per person or $10 per family, plus $10 per half-table to display your wares. The fees are waived for outside clubs and service (ARES, RACES, CERT, etc.) groups who want to use our swap meet to promote their activities. Dave Becar KI6OSS said that he plans to hold an exam session just outside the pavilion, under the Laurel VEC. We'll post that info as we get closer.

Winter Field Day

In photos

Events

Upcoming happenings

Brass Tacks

An in-depth look at a radio-related topic

Instrumentation and test devices

We human beings seem to have this need to measure things, from the temperature of the room to the distance to Grandma's house. For some reason, we want to know our heart rate, our IQ, and how long it takes for paint to dry. There might come a time when you'll want to measure something on your radio, antenna, or other gear. ***Instrumentation*** is a word that means *device or software used to measure, test, and/or monitor something*.

In the world of amateur radio, we have a lot of scientific measuring devices available to us, but fortunately, only a small subset is truly useful to any practical extent. I mean, if people tell you that your signal isn't getting out like it used to, you'd probably like to know what changed, and how to test that. Let's explore the devices you as a licensed operator might care to use, and list a few others. The intention is to distinguish between the basic equipment you might need and that of a fully-equipped diagnostic facility. To that end, I've grouped this discussion into three categories, by instrumentation ***you must have***, those that are ***nice to have***, and ***others***.

Must-have measurement instruments

I've been asked many times what testing or measuring devices ***must*** be in our possession as a radio amateur, and my answer is often, ***none***. If you ***are*** a person who feels the need to measure or monitor something anyway, then I recommend this list:

- **S-meter**

An ***S-meter*** (signal strength meter) is built into most transceivers, to display the relative strength of the signal being received at the tuned frequency. So, an additional discrete measuring device is typically not needed, but I mention it here for completeness, because it's a meter that an operator should have, if any.

In the HT (handheld transceiver) example to the left, the S-meter is displayed as the dashed line across the bottom of the display. In this case, it looks like the HT is displaying about an S8 signal strength. Also, below is an example of an S-meter that might appear on an HF (high frequency) transceiver, as a needle over a set of values. In this example, the S-meter values are displayed across the top, so it appears that the S-meter is measuring a received signal strength of about +27, which means "about 27 dB over S9" or 2 x 2 x 2 x 2 x 2 x 2 x 2 x 2 x 2 = 512 times the strength of a typical S9 signal.

Brass Tacks

continued

- **Power meter / "watt" meter**

A ***power meter*** displays the amount of RF (radio frequency) power (in watts) that's being transferred somewhere, like from your radio to your coax, or from your tuner to your antenna. More often than not, such a power meter is built right in to your transceiver, so a separate piece of equipment to display measured power is not usually necessary. Still, it's essential to know how much RF power your rig is attempting to deliver to the antenna, especially on a fixed station.

On many, if not most, HTs (handheld transceivers) and mobile units, the power meter displays a series of bars on a graph, similar to the S-meter mentioned above. Typically, this bar graph only presents a relative quantity, such as discrete "Po" or "PO" units. Obtaining a more accurate RF power reading will likely require a separate, external power meter.

An ***RF power meter*** displays the output of your transceiver somewhere along your transmission line (coax). Discussed later, a ***field-strength meter*** measures the RF power that your transceiver sends out through your antenna. Yet another type of power meter measures the amount of ***DC power*** that your transceiver and other equipment draws from your power supply. And there are other power meters, so referring to a "power meter" can be ambiguous.

Bird 43 wattmeter

Other types of watt meters include peak-reading, average-reading, and directional. I won't go into detail about those here, but there's one make that I would like to mention: the Bird wattmeter, because many have asked my opinion about it. It's a very accurate and directional (can display how much power is being transferred in each direction) meter, and the Model 43 is considered the professional industry standard, and therefore very expensive ($700 to $1100 new). For most amateur needs, the Bird wattmeter is very much overkill, IMO.

- **SWR meter**

An ***SWR meter*** is an instrument that displays the ***standing wave ratio*** of your antenna system. That is, it compares the amount of power being delivered to a load ("forward power" or "incident power"), with the amount of power being reflected by the load ("reflected power"), due to an impedance mismatch, the case in which the impedance of the load does not perfectly equal that of the source. Because an SWR meter can measure the forward power, an additional power meter is more than often not needed at the same point.

An SWR meter requires power from the transceiver to work, and so must be inserted in the feed line between your transceiver and your antenna. Then, it'll display the SWR value as you transmit on your radio. Many transceivers, especially HF rigs, have SWR meters built into their displays, and will show the values while you're transmitting and if the *SWR meter* is selected.

Today's SWR meters tend to come in any of three flavors of readout displays: digital, gauge, and cross-needle. A digital

Brass Tacks

continued

readout displays numerals for forward power, reflected power, and the SWR. A "gauge" meter displays the SWR by a needle across the dial, like the S-meter in an HF transceiver. A cross-needle display shows the forward power by one needle and the reflected power by the other needle, and you can read the SWR where the two intersect.

The SWR meter is good for a "sanity-check"; that is, provides a quick and easy way to visualize your antenna system SWR *at one particular frequency*. To get the "bigger picture" requires an instrument that can display the SWR for an entire band, for example. That's the job of an antenna analyzer.

Cross-needle SWR meter

- **Antenna analyzer**

An ***antenna analyzer***, like the RigExpert AA-170 to the left, measures a number of things about your ***antenna system***, which includes your coax, tuner / matching, and antenna, without the need of any applied signal from your transceiver. Among the important quantities measured is the ***SWR bandwidth***, which is the range of frequencies for which the detected SWR is 2.0:1 or lower.

If you're the type of person who plans to make more than two or three antennas, then I highly recommend an antenna analyzer be part of your arsenal. On one hand, they can be expensive; on the other hand, if you're a regular antenna builder, you can justify the cost, especially for their convenience if you need to take many measurements while tuning your antenna.

One instrument that has taken the antenna analysis world by storm is the ***NanoVNA***. It's a true VNA (vector network analyzer), and its ability to perform antenna analysis, coupled with its very low price tag, has made it nearly indispensable to the amateur crafter. It does have somewhat of a learning curve, but I believe its low price and high functionality outweigh the time and effort you invest.

- **Multi-meter**

Once in a while you might want to measure your battery or solar panel voltage, your wall socket (house current) voltage, the resistance in your connections, or whether your coax has a short in it. If you do, a ***multi-meter*** might be what you need. But if you only need to measure voltage, why not just get a voltmeter? Because today, the technology makes it easy to combine several measurement functions into a single instrument, so meters that measure properties like voltage, current, and resistance tend to be packaged together..

As mentioned, a multi-meter is so-called because it can perform several functions, most typically that of a ***voltmeter*** (measures voltage),

Brass Tacks

continued

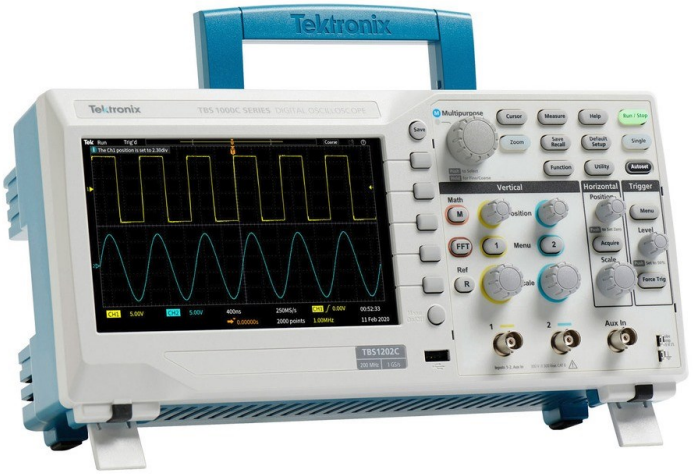
ohmmeter (measures resistance), and ***ammeter*** (measures current), then display their measured quantities. More sophisticated multi-meters can measure and display other interesting properties, such as power, continuity, temperature, humidity, wind speed, and more.

It honestly doesn't matter whether your multi-meter is modern (***DMM : digital multi-meter***), analog (***VOM : volt-ohm meter***), or something more ancient (***VTVM : vacuum tube voltmeter***), as long as it works reasonably well for your needs. A DMM is my choice of multi-meter, but its biggest drawback is its inability to display more than one value per interval, like every second. This way, the values that might be present between those interval samples could easily be missed, like voltage spikes in your power supply.

Nice-to-have measurement instruments

Some useful instrumentation might not be as essential to your needs as those in the previous section. That could be due to their usage frequency, their utility, or being out-of-reach due to their price. Here are some measuring tools that might come in handy (assuming you know how to use them), but can probably wait until you really need them or can afford them:

- **Oscilloscope**



An ***oscilloscope*** (often abbreviated as an *o-scope*) is a laboratory instrument that can display a signal waveform (shape of a periodic wave), even a complex one. The advantage of viewing a signal waveform is that it provides a snapshot of the signal during one period, allowing you to see an entire cycle of its voltage transition as a function of time. This way, you can be sure that the waveform is correct (square wave, sinusoidal, modulated carrier, etc.) and not a distorted (clipped, over-damped, etc.) version of it, allowing you to quickly test, verify, isolate, and debug a circuit if the signal is not as expected.

The proper operation of an o-scope requires more than a casual knowledge of electronics by the operator, who is often an electronics technician. An o-scope is a must-have device for a person who spends quite a lot of time developing, building, and testing electronics, but not as necessary to a person who simply dabbles in basic antenna-building.

- **Field strength meter**

A few years ago, the FCC published updated guidelines on RF exposure, and gave us more than a year to comply with them. Most of the guidelines could be met by making a few station assumptions, but if you really wanted to be certain about the RF radiation you're exposing your family and neighbors to, you would need to perform some actual testing. This requires the use of a ***field strength meter***, which can display the relative RF electric field strength of a transmitted signal for a specific frequency at a specific height and distance from an antenna.

Brass Tacks

continued

One helpful thing that can be learned from a field strength meter is the radiation pattern of an antenna, if that's important to you. And that could be important if you suspect your antenna pattern takeoff angle might be pointed too high to reach distant stations, or if your radiation pattern is a little more directional than you'd like it.

A field strength meter is nothing more than a simple receiver that's sensitive to the electric field at a particular frequency, regardless of mode. Professional field strength meters have been used to measure and verify the signal strength of broadcast radio and television stations as it's received over large distances, such as counties or small states. For amateur purposes, because most field strength meters are mode-agnostic, it's best to test your field strengths by using a transmitted carrier, such as with AM, CW, or FM.

Field-strength meter

- **Spectrum analyzer**

Another useful tool is the ***spectrum analyzer***. While an oscilloscope measures and displays voltages over a period of time, a spectrum analyzer uses an FFT (Fast Fourier Transform) to convert the signal from the time domain to the frequency domain. This converted display allows you to visualize the behavior of a signal across a wide range, or spectrum, of frequencies.

The spectrum analyzer is useful for exposing problems such as harmonics (multiples of a signal frequency) and spurious (imitation) emissions that your radio might be transmitting in a band outside the amateur or other bands of interest. It can also used for identifying noise and other interference sources because the spectrum analyzer displays a graph of signal strength per frequency, and interfering signals will appear as spikes or relatively strong signals at the culprit frequencies.

Similar to the NanoVNA, the ***tinySA*** is a miniature, hand-held version of a fully equipped spectrum analyzer, that's proving to be a viable, useful, and inexpensive alternative to the standard instrument. Its frequency spread isn't as large, and it has fewer features than the standard spectrum analyzer, but if you need to examine amateur signals by a frequency spread, the tinySA might be in your future.

The tinySA

- **VNA**

One instrument that many RF engineers consider indispensable is the ***VNA*** (vector network analyzer). Think of your transceiver, your feed line (coax), tuner, and antenna as part of a network of components, some active and some passive (don't require external power to make them work). Erratic voltages and currents, like you might measure with an oscilloscope, can be difficult to display at high frequencies, so a VNA can accurately display the power and phase of a signal as it travels through the network.

Measuring the signal power and phase in one direction provides part of the network picture,

Brass Tacks

continued

but the signal also needs to be evaluated in the opposite direction for properties such as reflection. So, instead of disconnecting and then reconnecting your network in the opposite direction, the VNA provides two ports to facilitate this. For this reason, a VNA is also known as a ***two-port analyzer***.

High-frequency electrical networks can become very complex without much effort. The VNA helps simplify the complexity by use of what's known as S-parameters (scattering parameters). These values help detail how high-frequency energy propagates through an electrical network. They offer comprehensive insight into the linear behavior of RF and microwave components, and provide the very bases for filter, transmission line, and amplifier design.

Although you're not likely an RF engineer, you might still find a VNA useful in antenna modeling, feed line analysis, phasing, and for measuring a number of important properties, such as impedance, return loss, insertion loss, and SWR. *Phasing* is important if you want to construct an array of antennas to improve its overall gain. It can also be used in troubleshooting such problems as EMI, jitter, ground bounce, and crosstalk.

- **Power monitor**

DC power monitor

Unlike a power meter, mentioned above, a ***power monitor*** measures and displays the voltage, current, and sometimes other properties of your power line, whether that's DC (direct current) into your radio or single-phase AC (alternating current) into your power supply and amplifier. Many power monitors have the ability to interrupt the power under an adverse condition, such as over-current or a brown-out. If you live in an area of frequent brown-outs or poor power conditioning, a power monitor such as a USP (uninterruptible power source) might help you.

One type of power monitor not only displays voltage and current, but also power consumption by your equipment. An immediately useful application of a DC power monitor is at your solar charge controller, where the monitor can give you some idea of its conversion efficiency.

Other measurement instruments and thoughts

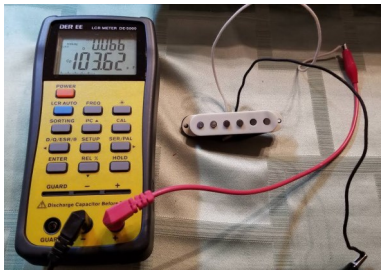
We're not going to discuss every piece of instrumentation available to us, but this short list represents some that might be useful, depending on your needs:

- **Frequency counter** (detects the frequency of an unknown signal)
- **Thermometer / temperature gauge**
- **Logic analyzer / logic probe** (compares the states and timing of several digital signals)
- **Battery tester** (gives you an idea of battery charge level and remaining life)
- **Service monitor** (combination device that can measure signal-to-noise ratio, modulation integrity, tone encoding, spectrum analysis, and more)

Brass Tacks

continued

- **LCR meter** (one that can measure the inductance of inductors, the capacitance of capacitors, and impedance.



The DE-5000 LCR meter

Instrumentation calibration

Your test instrument is only as good as its calibration. Maintaining good calibration on your equipment can provide accurate results, but there are a few trade-offs to think about.

1. One of the first considerations to calibration is the ***cost of performing the calibration***. If you can calibrate it yourself, then you've saved on hiring a professional and the cost of shipping the device to the calibration lab. But if the calibration procedure is so difficult that you need to a) take a week to learn it and b) purchase special calibration equipment to get it done, you might need to ask yourself whether the calibration is all that necessary, and if it is, then whether you should eat the cost of having the lab do it after all.
2. The finer your accuracy demand, the more often and "closer to spec" you'll need to calibrate your test instrument. If your power ("watt") meter displays between 60 watts and 70 watts during a test transmission, when your mobile radio is set for the full 65 watts, it's probably not in need of calibration. Even though it's a little off, it probably reads "good enough" for what you need.
3. Some instruments, such as the pixel-displayed S-meter on your fancy HF transceiver, might be quite difficult (meaning *impractical*) to calibrate, and is not likely worth the cost and effort to send in the unit to get it done. If you find that one of your test devices (such as an SWR meter) seems ***way*** off, and yet it's nearly impossible to calibrate it (because it's built into a software application, for example), the problem might be with something else (like your antenna).
4. The factory calibration performed for many modern devices likely never need re-calibration unless they've been damaged in some way. Most high-quality DMMs, for example, arrive fully calibrated, and so probably never need to be re-calibrated.
5. The calibrations mentioned above are "factory" calibrations; that is, each is performed typically by a professional, to ensure an instrument's accuracy. The last calibration is a "per-use" calibration; that is, a minor calibration performed by you, before using the device that day. For example, an oscilloscope requires an expensive and detailed professional calibration by a trained expert, while a NanoVNA requires you to run through its brief calibration procedure before using it, to compensate for variations in temperature, vibrations, and humidity.

Summary

Any testing or measuring device or software can be considered instrumentation. Most instrumentation can be considered non-essential to your particular needs, but even the essential ones are likely few, if any. Calibration is often an after-thought that many (amateurs and professionals alike) overlook, yet can be important, but its cost versus benefit must be taken into account.

Noji Ratzlaff, KNØJI (kn0ji@arrl.net)

Dear Annette

What's on your mind? Serious, humorous, technical, and thoughtful answers to your deepest, (mostly) ham-related questions.

Dear Annette:

Now that the ARRL is no longer printing the *QST* magazine, and that yearly membership is costing more, I'm seriously considering not renewing this year. What reason is there left for me to renew my ARRL membership?

Dennis in Pleasant Grove

Dear Dennis:

It's true that ARRL no longer automatically distributes the print version of *QST*, and that their annual membership is costing more, due to rising operating costs. If you hear about a family who just lost their home to a fire, and an account was set up for them, and you want to contribute to help them, do you ask what you're going to get from your payment, what's in it for you? In the end, while your ARRL membership actually buys you quite a lot (spectrum, representation, education, leadership), it's not really about *you*, but about your contribution to the greater good of amateur radio, by helping others.

Dear Annette:

Are you single?

Don in Provo

Dear Don:

I'm as single as my husband!

Dear Annette:

As I understand it, I shouldn't be talking on the radio with an unlicensed person. But how would I know if he is not licensed?

Lori in Springville

Dear Lori:

As you say, according to Part 97.111(a)(1), a licensed amateur can use amateur radio frequencies only to communicate with another licensed amateur. However, it's also true that you, the licensed amateur, might not be aware that the other operator is unlicensed, even after listening for a call sign or asking for it. According to the ARRL Regulatory Information Manager, it's not your responsibility to research the licensure of the operator on the other end, but that if you do become aware of his or her lack of license, you can invite the person to become licensed. That being said, keep in mind that the unlicensed operator could be sitting with a licensed one.

Dear Annette:

I stumbled on the UVARC website and saw your section in the newsletter. Is there a class in Utah County or a book you would recommend to understand how to get started from the very beginning, i.e., this your radio, this is how you use it, and then moving onwards and upwards? I've got the manual for my Baofeng UV-5R, but it's, shall we say, less than helpful.

Roger in American Fork

Dear Roger:

Welcome to the world of ham radio! We used to hold classes of the kind you describe, in a monthly in-person forum called *Ham Radio University*, which we hope to restart some day. Meanwhile, I believe these links will be of help in your new adventure:

- How to manually program your Baofeng
- How to computer-program your Baofeng
- How to get started in ham radio
- How to use your radio in every way

You might also find Noji's website useful during your ham radio journey.

Got a question for Dear Annette*? Email it to* ***uvarcshack@gmail.com*** *and include your town name. Sorry, no guarantees.*

The Amateur in You, Part 1

What have you been pondering?

American call sign rules

When I first got licensed as an American amateur radio operator, I was issued a unique ***call sign*** by the FCC, who used a sequential system of call letters, based on my license class and the mailing address that I provided on my application. Since then, I had applied for, and received, a ***vanity call sign***, which replaced my original one. That new call sign is what I use to this day, on my vehicle license plates (known as *personalized plates*), my hoodie, my club badge, and on the radio.

Format

Here are a few of the important rules that govern the US call sign format.

- Each must have __ __ **X** __ __ __ as its format: one or two letters before the numeral; one and only one numeral; and one, two or three letters following the numeral. The numeral can be any digit Ø through 9.
- The first letter must be K, N, or W, and if the operator is an Advanced or Amateur Extra class licensee, it can also start with A.
- The second letter before the numeral also has rules governing which can be used, based on your current mailing address location, such as Alaska ("L"), Hawaii ("H"), or Virgin Islands ("P").
- Not actually a rule, we often say "NxM" (pronounced "N by M") call sign for one that contains N letters before the numeral and M letters after the numeral. This way, mine, KNØJI is a "2x2" call sign, and my wife Lisa's, KR5LYS is a "2x3" call sign.
- Only an Amateur Extra licensee can hold a "1x2" or "2x1" call sign.
- Your call sign can be followed by a self-assigned indicator, like /AG or /7.

Uniqueness

Nobody in the entire world has the same call sign as me, so when I announce it as my ***ID***, people know that it's me, and nobody else. Then again, just like we do at Field Day, an unlicensed or under-licensed person can use my call sign, provide 1) they have my permission, 2) I'm in proximity of the transmitting station, and 3) I'm awake.

Vanity call sign

Any licensed amateur can request a vanity call sign, which replaces the original call sign, provided the requested call sign is not already being used. You can only request a call sign that fits the rules mentioned above for your current license class, even if it's one that's once held by a close relative.

You cannot receive a call sign whose last three letters are those of a Q code (like "QRZ") or distress signal (like "SOS").

Special event call sign

"1x1" call signs are reserved for special event stations, and you can request a temporary one free-of-charge for your event.

Finally

Your call sign is the only thing required during your radio transmission. Not your name, not another person's call sign, nothing.

Nobody can legally use my call sign without my permission. If my license expires, I cannot use my call sign on the radio until its renewal appears in the ULS. If I do not renew my license within two years of its expiration, I must retake the exam, and the FCC will issue me a new call sign from the Sequential System, if I wish to transmit on ham radio.

While most countries follow a similar format, some do not, so you might be pleasantly surprised when you make a contact with 8P5A from Barbados, for example.

Noji Ratzlaff, KNØJI (kn0ji@arrl.net)

The Amateur in You, Part 2

What have you been pondering?

Your two-minute warning

You hear a loud knock at your door, ***Fire department...you have two minutes to leave your house!*** In the November 2019 issue of *Reader's Digest*, several homeowners recount hearing those very words during the devastation of the July 2018 fire that ravaged houses in a suburb of Redding, California, in which more than 38,000 were forced to evacuate their homes. If you had only two minutes to leave your home and property, what would you take with you? In most cases, you might not need to evacuate your home at all, but let's stop and consider a situation that might require you to vacate with little notice.

People and animals first

Your first concern is for the people in your household, and then your animals. Your animals can be domestic pets, service animals, or livestock. Plan a way for people and animals to escape quickly. Take into account age and disabilities, and how long it will take to evacuate those who might need assistance.

A grab-and-go bag is essential

Stored in a closet right by your front door is your grab-and-go bag, which contains all the personal and family items you had planned for an evacuation just like this, long ahead of time. You've stored away bandages, water, toilet paper, over-the-counter medicine, lighter, headlamp, batteries, clothing, ham radio, and other things you and your family need. The convenience of such a bag cannot be overstated, since all your essentials can be picked up in that bag and taken with you in seconds. Remember to rotate out expired medicines and other perishables every six or so months.

Maintain a communication method

Taking your smartphone with you goes without saying; it's going to be your primary lifeline to the rest of the world. In a widespread disaster, however, cell towers become easily overloaded, so you need to have a backup plan, which should include ham radio. Be sure to take a handheld ham radio with you as you evacuate your property. And if you've already stashed one in your grab-and-go bag, that's one less thing to think about collecting.

Other important items to take along

Here are some things to think about:

- Keys to your house and vehicle
- Warm clothing and jacket
- Laptop with important documents and passwords (and charger)
- Cash, credit cards, other forms of payment
- If you have the time and luxury, toys and games for the little ones, mementos (such as photographs, jewelry, and sentimental items), snacks to tie you over for a while

More than two minutes

In a widespread disaster, such as the California wildfire just mentioned, you and your family will most likely have known about the quickly moving flames, how close they were to your place, and the ensuing general evacuation order, long before the two-minute warning is sounded. If you haven't already collected the things you need for your evacuation, those warnings alone should give you a chance to re-adjust your priorities and start gathering your needed items. On the other hand, an earthquake might not give you much warning at all. And if this training topic will do any good, it might help you get a start on that list of items today, plenty of time before any such disaster has occurred.

Hot Tips

Good info for the new ham, and old stuff to refresh your memory

Dust on your equipment

Not long ago, a local ham asked for help to figure out why her radio signal doesn't get good reports anymore. Turns out, her coax connector that plugs into her radio was coated in dust, so once we cleaned off both connectors, she was back in business. Seems that she and her husband had recently installed some cabinetry in the room where her coax laid disconnected, allowing the drywall mud dust to settle on everything in the small space.

Dust is a common nuisance that typically doesn't require constant attention, so its presence is often overlooked, sometimes leading to less-than-favorable effects on your equipment. We lead busy lives, and playing with our radio equipment is not likely something we do daily, so an undesirable layer of dust tends to make its home on our expensive gear as a result. Often, that dusty layer is only an eyesore, and gives your equipment a slightly vintage appearance, but that same dust can also damage your equipment.

So, where does all this dust come from? Our earthly air is normally dusty, unless we live in an expensively controlled environment, like a clean room. Dust contains soil, fine hairs, spores, clothing fibers, pollen, dead insect remnants, bacteria, and other undesirable contaminants. Some dust particles are visible, but much is so fine that only a microscope can detect its composition.

Probably the most common problem with collecting dust is its effects on radio displays. You can easily wipe the dust collected on your display, so that you can see your little screen once again, but that actually causes another problem. As you wipe the dust off a display, you might not realize just how abrasive the dust is, and indiscriminately scratch your display with each wipe, eventually rendering the soft plastic (or even glass!) face to become increasingly unreadable. To more gently remove dust from a display, use a slightly damp cotton cloth. Not a tissue, not a paper towel, and certainly not your finger.

Dust can harm your radio equipment by collecting on air vent or fan openings, preventing proper ventilation, leading to premature equipment failure by overheating. Instead of wiping or dismantling your fan or vent openings, try vacuuming out the dust.

Finally, dust is typically non-conductive, and when deposited between contacts, can create partially open connections, like in the above example. However, dust can also contain metallic or partially conductive materials. When deposited across components, it can actually create a mild short, which can route too much electrical current into the wrong path, possibly resulting in component failure or even a fire.

So, does all this mean you need to keep your equipment perfectly dust-free? Of course not, but it might be wise to occasionally check for excessive dust on surfaces whose appearance or operation might be affected, then clean them appropriately. It might not hurt to keep your radio gear in a dust-free container or under a dust cover.

DIY

Worthwhile projects you can build on your own

9:1 voltage unun

In a previous article, we discussed the end-fed antenna, and how it often exhibits a large impedance, anywhere from 1800 ohms to 5000 ohms. If your particular end-fed antenna exhibits a much lower impedance, like 450 ohms, or you're attempting to match your 50-ohm coax to a 450-ohm ladder-line, then you'll likely need to transform your impedance by 450 ohms ÷ 50 ohms = 9:1.

The end-fed antenna is unbalanced, meaning its two sides are not equal in length, impedance, or material, while the ladder-line is a balanced feed line. These two objects require 9:1 impedance transformation, but in different ways. Because this discussion focuses on the end-fed antenna, let's examine how to build a 9:1 ***unun*** for it, then explain the modification necessary for a 9:1 ***balun*** for a balanced target such as ladder-line.

As mentioned in the title, this project is for a voltage unun, because the transformer attempts to balance its input and output voltages, regardless of presented impedances. It does so by means of an autotransformer, of which both sides share a single winding.

The advantage of a voltage unun is its ability to easily match impedances, unlike a current unun, which uses an isolation transformer to balance its input and output current, but suffers from impedance matching ability. However, an additional disadvantage of a voltage unun is excess common-mode current creation, so we'll discuss this at the end of this project.

Parts list

One toroidal T-200-2 ferrite core

21 inches of 22 AWG 3-conductor zip wire

One 4.5″ x 3.5″ x 2.2″ enclosure

Two 14 AWG #8 stud ring terminals

Two #8 screws, wing nuts, washers, split washers

Zip ties, Super Glue™, heat shrink tubing

One SO-239 bulkhead connector

Four each M3 screws, split washers, nuts

One 1-½″ x 3/16″ eye bolt

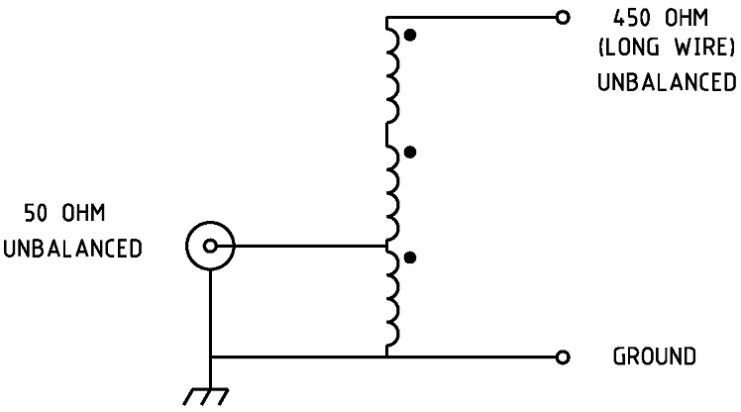
One 14 AWG #4 stud ring terminal

One 2-½″ x 2-½″ fiberglass screen

One 450-ohm resistor (for testing only)

Coil assembly

The diagram to the right shows what we're trying to accomplish. The purposes of this design are to maintain a 50-ohm impedance transformation on the transceiver side of the unun for a wide range of frequencies on 100 watts of transmit power.



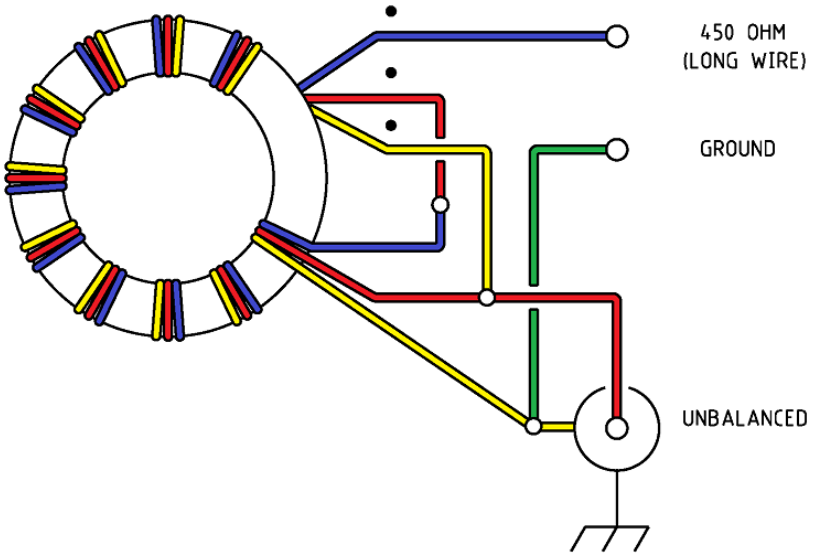
Tightly wrap 10 turns of the 22 AWG zip wire triplet around the toroidal core, leaving about four inches extra on each end. Secure both ends against the toroid with zip ties, then

DIY, continued

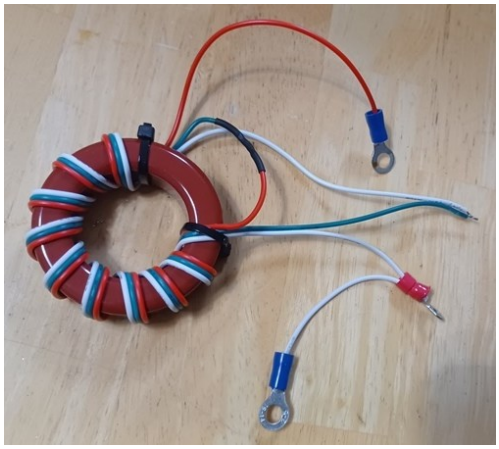
9:1 voltage unun

strip all six wires. Our white wire corresponds to the yellow wire in the drawing.

For the sake of description, I'm going to refer to the wires in the drawing and the photo on the right by the *bottom wires* and the *top wires*, as they're oriented on this page. This way, the bottom wires enter the side of the toroid facing us, and the top wires exit the side of the toroid facing away from us.



As you're connecting the wires, cut them to appropriate lengths, so that little excess wire exists anywhere near the coil. First, solder the bottom white wire and a separate 3″ white wire (left over from cutting) to the #4 ring terminal. Solder the other end of the separate 3″ wire to a #8 ring terminal. Next, solder the bottom green wire (looks kind of blue in the photo) and the top white wire together. You'll solder this junction to the solder cup of the SO-239 bulkhead connector later. Third, slip a piece of heat shrink tubing over the bottom red wire, then solder the bottom red wire and the top green wire together, and shrink the tubing over the junction. Finally, solder the top red wire to a #8 ring terminal. That completes the coil assembly.



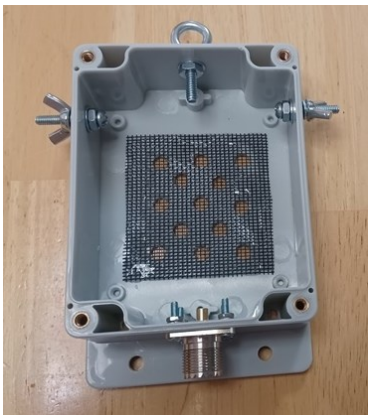
Enclosure assembly

Drill a 9/16″ hole in the enclosure at one end I'll call the unun bottom. Place the solder cup end of the SO-239 bulkhead into the 9/16″ hole on the outside of the enclosure, and using the four mounting holes of the bulkhead as a template, drill a 1/8″ hole for each mounting hole. Assemble the bulkhead onto the enclosure using

DIY, continued

9:1 voltage unun

the M3-0.5 mm hardware.



Drill eleven to fourteen ¼″ holes in the back of the enclosure, for ventilation. Cover the holes by super-gluing the fiberglass screen over them on the inside, to prevent insects and debris from entering the enclosure.

Drill a 3/16″ hole in the unun top, about ¾″ from the back of the enclosure. Install a flat washer onto a 3/16″ eyebolt, and slip the eyebolt assembly through the hole. Secure the eyebolt with another flat washer and a nut. This eyebolt can be used to hang the unun and relieve some of the strain on the wire elements due to the weight of the unun and the coax.

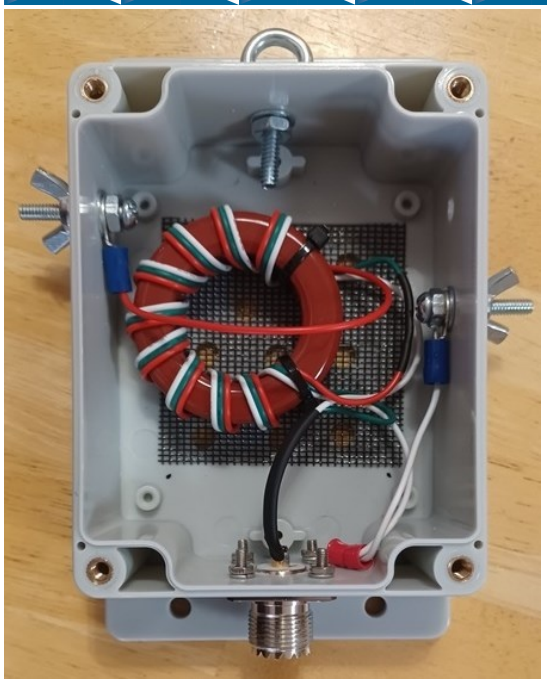
Drill two 3/16″ holes on opposite sides of the enclosure about an inch below the unun top (the end opposite that of the bulkhead connector) and about 1″ from the back of the enclosure. Slip a #8 machine screw through each ring terminal, then tighten a nut onto the screw to hold the terminal in place. Slip each assembly through the side hole from the inside of the enclosure. On the outside of the assembly, apply another flat washer, lock washer, and wing nut.

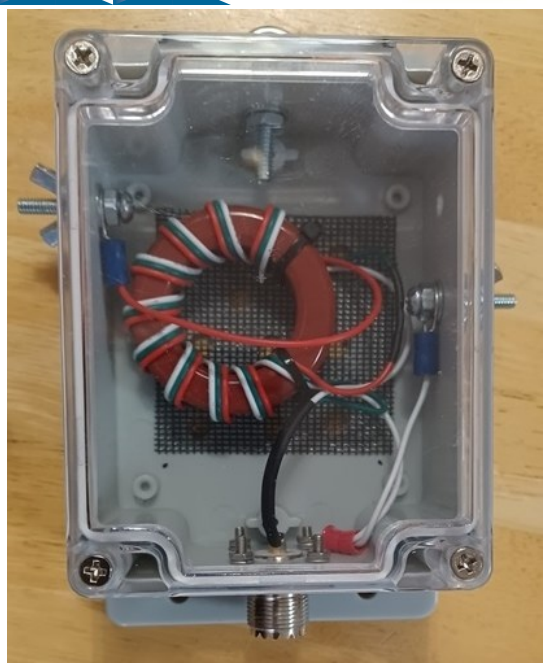
Plug a PL-259 connector into the SO-239 bulkhead, for a heat sink. If you don't plug in a connector, soldering the cup in the rear of the bulkhead can get hot enough to melt the dielectric, especially if you're using a low-wattage (under 60 watts) soldering iron. Slip a piece of heat shrink tubing over the insulation of the soldered (bottom green and top white) wire pair, solder the pair to the center post of the SO-239 bulkhead connector, then apply the heat shrink tubing. Remove the PL-259 connector. Bolt the #4 ring terminal of the white wire pair to one of the M3-0.5 screws of the bulkhead inside the enclosure.

Secure the coil to the inside of the enclosure with a dab of hot glue or other non-metallic adhesive, such a double-sided tape, to prevent the coil from dislodging its wires during movement and transportation. Be sure to allow space for sufficient airflow through the ventilation holes. Install the enclosure cover, and the unun construction is complete.

DIY, continued

9:1 voltage unun

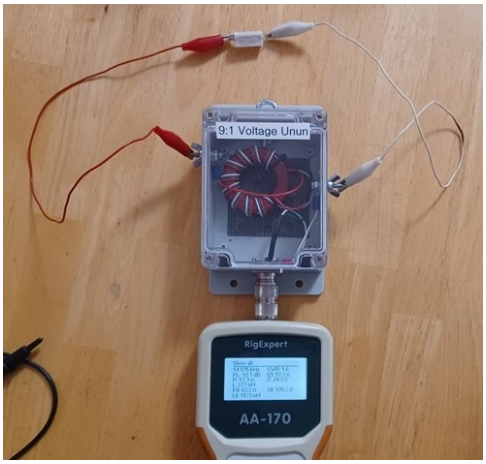


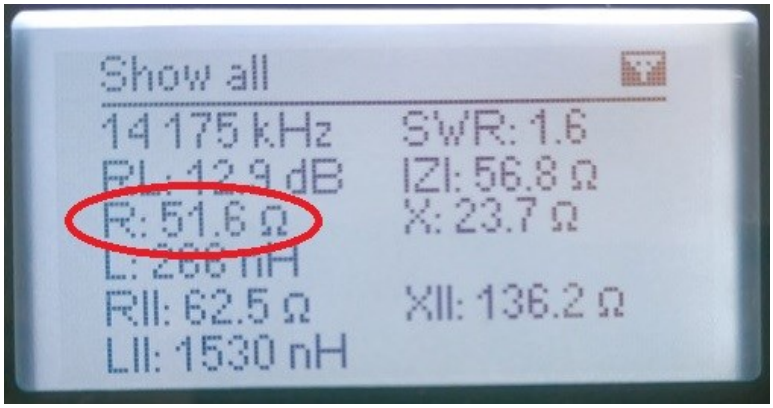


The completed 9:1 voltage unun

Testing the unun

Connect a 450-ohm resistor to the wing nuts on the outside of the unun. Install a short length of coax between a NanoVNA or antenna analyzer and the unun to measure the resulting impedance. If the unun is working as it should, to transform the impedance, your instrument should measure around 50 ohms at the coax. Mine was connected as follows, on the left; on the right is the closeup of the transformed result:





Noji Ratzlaff, KNØJI (kn0ji@arrl.net)

Living in the Past

Historical perspective

Namesake of the Yagi antenna

While you yourself might not use one, if there's an antenna picture that's ever been associated with ham radio, it's that of the *Yagi antenna*. Until cable TV swept the globe, its odd shape could be seen mounted on millions of rooftops world-wide as an effective receiving aerial.

Today, we credit Hidetsugu Yagi with the patent of the Yagi antenna, his namesake. But the antenna is more properly called the Yagi-Uda antenna, after the two who actually developed it, including Shintaro Uda, its primary inventor.

Yagi was born 1886 in Osaka, Japan, just two years before Heinrich Hertz began his experiments on radio wave phenomena. Early on, he preferred the arts rather than the sciences, but gradually fell in love with the physical sciences. Eventually, he earned an engineering degree from Tokyo Imperial University at age 24, then started teaching at the Sendai Engineering High School. After four years of teaching, the Ministry of Education sent him on a European tour to further his education.

Yagi first went to Germany to study resonant transformers, but was interrupted by World War I in 1914. He left Germany and headed for England, and started working for John Fleming. After two years of experimental studies with Fleming, Yagi came to the US to work at Harvard University with none other than George Pierce, the developer of the Pierce oscillator. While in the US, Yagi joined the IRE, the forerunner of the IEEE, giving him access to American engineering resources when he returned to Japan.

Yagi earned a doctorate in his home country in 1921, two years after his Sendai Engineering High School merged with Tohoku Imperial University. He soon gathered an elite team of students to help with his research on radio wave generation.

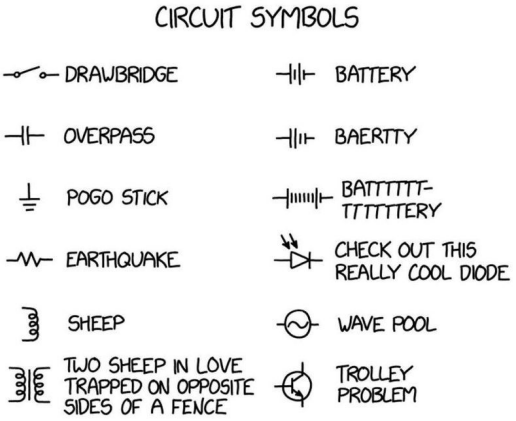
Among Yagi's students was Shintaro Uda, who soon began experimenting with vacuum tube triode oscillators and formed waves into a directional beam with a strange-looking antenna. Uda created the antenna by measuring the radiation patterns of the field, altered by parasitic loops, and later rods, placed at specific positions around the resonant driven element. Uda proceeded to publish a series of papers that described the evolution of this new and effective antenna, both in Japan and in the IRE, under Yagi's direction.

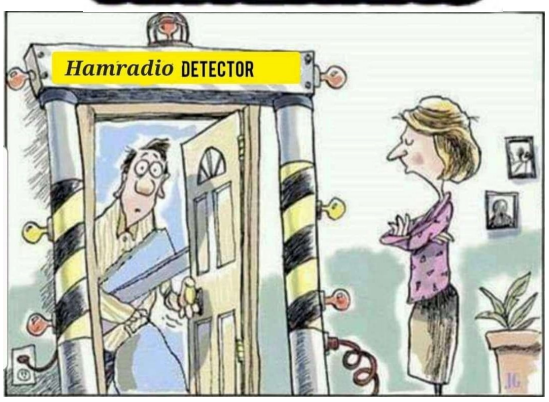
Yagi using his namesake

Eventually, Yagi applied for a patent on behalf of Uda, no intended deception or credit-taking on his part, both in Japan (later transferred to the Marconi Company) and in the US (later transferred to RCA). You can read more about Hidetsugu Yagi on ARRL (members login).

Side of Bacon

A little ham humor





Achtung! Alles Lookenspeepers!

Das computermachine ist nicht fuer gefingerpoken und mittengrabben. Ist easy schnappen der springenwerk, blowenfusen und poppencorken mit spitzensparken. Ist nicht fuer gewerken bei das dumbkopfen. Das rubbernecken sichtseeren keepen das cotten-pickenen hans in das pockets muss; relaxen und watchen das blinkenlights.

For Your Insight

Information you could use

Club meeting format

Here's the usual agenda for club meetings, at the Orem City Council Chamber Room, 56 N State St:

Talk-in frequency on the club repeaters

6:30 pm : Eyeball QSO

socialize / put faces with call signs

radio programmers available to help you

6:45 pm : Call the meeting to order

meeting lineup (agenda)

announcements / calendar / new hams

7:00 pm : Discussion / presentation

7:45 pm : Door prizes

7:55 pm : Dismiss and disassemble

8:00 pm : *Club QSY* to a local eatery

Something you'd like to see at the meetings?

Thanks to Heath Stevenson for making our monthly meetings possible!

Monthly meeting help

We're grateful for the volunteers who help with various tasks that make our club night just that much more friendly and useful to everybody. Monthly, we need help with

programming radios (thanks, Ralph!)

taking photos or videos during the meeting (thanks, Joe!)

operating the talk-in radio

setting up tables and chairs (thanks, Heath!)

Lynx

Websites for your education and leisure

Ham Radio Equipment
Ham Radio Nets
Radio Programming
Net Training Topics
76ers Group and UVARC Group pages
New Ham Page

Send your input to ***uvarcshack@gmail.com***

Test your knowledge

General and Extra review (answers next page)

G7BØ9 : What determines the frequency of an LC oscillator?

A. The number of stages in the counter
B. The number of stages in the divider
C. The inductance and capacitance in the tank circuit
D. The time delay of the lag circuit

E3C14 : Why does the radio-path horizon distance exceed the geometric horizon?

A. E-region skip
B. D-region skip
C. Due to the Doppler effect
D. Downward bending due to density variations in the atmosphere

Calendar

What's happening
(times are Mountain Time)

Provo Ham Exam Sessions

Provo Fire Station #2, 2737 N Canyon Rd

Sign up at HamStudy.org/sessions/nv7v

Wed 17 Apr, 7:00 to 8:00 pm

Sat 20 Apr, 2:30 to 5:00 pm

Wed 15 May, 7:00 to 8:00 pm

Wed 19 Jun, 7:00 to 8:00 pm

Wed 17 Jul, 7:00 to 8:00 pm

*Email **uvhamtest@gmail.com** for info*

Provo One-day Technician Courses*

Third Saturday Monthly at 8:00 am

Provo Fire Station #2, 2737 N Canyon Rd

** September through April*

2024 Orem Ham Radio Courses

Sign up at psclass.orem.org

Extra: Jul 16, 23, 30, Aug 6, 13

Technician : Sep 17, 24, Oct 1, 8

Club Meeting Calendar (6:30 pm)

On YouTube Live, and Facebook Live

April 4	May 2
June 6	July 18 †
August 1	September 5

† Ham Radio Fair, Pheasant Brook Park

** At the Orem Friendship Center*

Regular Nets

UVARC Family Net, Sun 3:30 pm, 146.780

NE UC ERC Net, 1st Sun 9 pm, 147.540 (s)

Health & Fitness Net, Mon 7 pm, 146.780

UVARC Ladies' Net, Tue 7 pm, 146.780

DMR Utah Net, Wed 6 pm, TG 3149, CC 1

Utah 76ers, Wed 7 pm, 146.760

UVARC HF Net, Wed 9 pm, 28.345 / 7.220

UVARC New Ham Net, Thu 7 pm, 146.780

CERT Ham Net, 2nd, 4th Thu 8:pm, 146.780

Utah County 6-meter Net, Fri 8 pm, 50.140

Family History Net, Sat 8 pm, 146.780

See a larger list of nets at noji.com/nets

Upcoming Contests

Solar Eclipse QSO Party

8 am to 6 pm Mon Apr 8

State QSO Parties

Apr 13 : NM, GA

State QSO Parties

Apr 20 : MI, ON

7th Call Area QSO Party (7QP)

7 am Sat May 4 to 1 am Sun May 5

See a larger list at contestcalendar.com

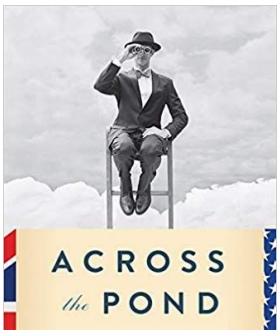
Answers to *Test your knowledge*

G7BØ9 : **C** (The inductance and capacitance in the tank circuit)

E3C14 : **D** (Downward bending due to density variations in the atmosphere)

Across the Pond

That is, the Utah Lake 'pond'



Eagle Mountain ham radio activities

A list of amateur radio activities near Eagle Mountain, organized primarily by Dave Becar KI6OSS. Unless otherwise noted, all these activities will be held at the Eagle Mountain City Hall, 1650 Stagecoach Run. Please contact Dave at **ki6oss6365@gmail.com** to register for any of the classes or exams, for any additional information, or questions in general.

April 2024 General Course

Thu 04 April, 7 to 9 pm
Thu 11 April, 7 to 9 pm
Thu 18 April, 7 to 9 pm
Thu 25 April, 7 to 9 pm
Thu 02 May, 7 to 9 pm

Ham Radio Exam Session

Sat 04 May 10 am
Open to all, for any license class

May / June 2024 Technician Course

Thu 23 May, 7 to 9 pm
Thu 30 May, 7 to 9 pm
Thu 06 June, 7 to 9 pm
Thu 13 June, 7 to 9 pm
Thu 20 June, 7 to 9 pm

Ham Radio Exam Session

Sat 22 June, 10 am
Open to all, for any license class

September 2024 Technician Course

Thu 29 August, 7 to 9 pm
Thu 05 September, 7 to 9 pm
Thu 12 September, 7 to 9 pm
Thu 19 September, 7 to 9 pm
Thu 26 September, 7 to 9 pm

Ham Radio Exam Sessions

Sat 21 September, 10 am (Swap Meet)
Sat 28 September, 10 am
Open to all, for any license class

Ham Radio Nets

Eagle Mountain ECT Net
Sundays, 9 pm 147.220+ MHz (151.4 Hz)

Eagle Mountain Chimney Rock Stake
Sundays 8:30 pm 446.500 (s)

Eagle Mountain Central Stake
Saturday 8 pm 145.650 (s)

Vendors

For your convenience

Pockrus Joystick J-pole

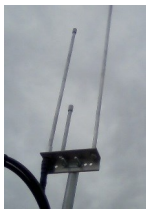
$30, open-stub aluminum half-wave, dual-band J-pole antenna

$40, 6-meter dipole, $20 for the 220 MHz (1.25 m) antenna

by Carl Pockrus, WE7OMG (email omgantennas@gmail.com to order)

Half-wave performance, solid construction, weather-proof, low wind-load

Probably the best-performing outdoor antenna you can get for the price



Super-Elastic Signal Stick

$22, vertical quarter-wave flexible antenna

by Richard Bateman, KD7BBC, of *SignalStuff* (and maker of *HamStudy*)

Super-performing antenna for your HT (handhold transceiver)

Visit SignalStuff and select SMA-Male, SMA-Female, or BNC

Ham Radio Podcasts v1.50

by Trevor Holyoak, AG7GX (email android@holyoak.com)

Stream podcasts (such as *100 Watts and a Wire*, *Amateur Radio Newsline*, *ARRL Audio News*, etc.) or download for later listening

For Android 4.1 and up (ad-free available for purchase)

Club Logo and Call Sign Embroidering

Want your call sign or name (or both!) embroidered on your shirt, your hoodie, your duffle? Or how about a club patch with your call sign?

by Glenna Gardner, WE7SEW (glenna0354@gmail.com or text 801-592-2503)

Call sign or name = $5, Both = $8, UVARC patch = $5, Patch with call = $9

Portable Aluminum J-pole

$60, sectioned, open-stub aluminum half-wave, dual-band J-pole antenna

by Stan, KJ7BDV and Kent, N7EKF (email skantenna@yahoo.com for info or call 801-372-7260)

Complete antenna breaks down into a compact 2″ x 6″ x 12″ package weighing only 3 lbs, perfect for backpacking and portable work where you really need a good 2-meter antenna

HamBadgers

Amateur radio name badges and other products

$10, official UVARC ham radio name badge with the club logo

Visit Ham Badgers and select Ham Radio Clubs > Utah Valley Amateur Radio Club

Email Eric Palmatier at hambadgers@gmail.com or call 919-249-8704

Where everybody knows your call sign

Utah Valley Amateur Radio Club
PO Box 1288
Orem, Utah, 84059-1288 USA

K7UVA
Phone/Text: 801-368-1865
Email: k7uva@arrl.net

Repeaters: 146.780–, 100.0
448.200–, 100.0 224.560–, 100.0
145.250–, 100.0 448.225–, 100.0
Newsletter input?
Email uvarcshack @ gmail.com
Need help?
Email uvarcelmer @ gmail.com

See all our newsletters on uvarc.club

We are the *Utah Valley Amateur Radio Club*, a 501(c)(3) non-profit (EIN 81-360-6416) Utah corporation (9752825-0140) that was organized in an obscure Orem fire station on 02-05-2016 to provide amateur radio enthusiasts in Utah County and surrounding areas a way to gather and discuss all things ham. Our primary purposes are to provide a local amateur radio resource, help new hams in their new-found adventures, and to give more experienced hams a reason to share their wealth of knowledge and wisdom in a friendly atmosphere of fellowship. We're an ARRL Affiliate and work in cooperation with the Utah VHF Society, but are not subsidiary to them, to ARRL, ARES, or any other organization, although many of our members and leaders might also belong to the same.

This newsletter is copyrighted and published by the Utah Valley Amateur Radio Club, and its purpose is to convey the tone and temperament of the club, to inform and entertain its members, and to entice the rest. To join, go to uvarc.club/join, then sign up at www.facebook.com/groups/uvarc/ to stay informed. For more information about our club or about amateur (ham) radio in general, please email or text or call us.

More than just a club, we invite you to become part of a great ham radio friendship in Utah Valley

Our fearless leadership

Presidency

President..... Noji Ratzlaff
Vice President..... Chad Buttars
Secretary.....Caryn Alarcon
Activities..... Michele Costello
Technology.....Trevor Holyoak

Board of Directors

Richard Bateman, KD7BBC
Carl Pockrus, WE7OMG
Aubrey Mikkelsen, K7GUM
Jeff McGrath, N1SC
Jody Dollar, K7BUX
Jeremy Giovannoni, K7TEH
Brad Kirk, AF7FP
Alma Perry, W1ZGY
Loren Chandler, WB1KE
James Brown, W7JHB
Harry English, AA1HE

Club Sponsor

Heath Stevenson, KK7KOU
Orem City Emergency Manager

From all of us to you, 73

Even Superman was at the club meeting...and won the club light!